



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street

San Francisco, CA 94105-3901

February 16, 2001

Mr. Nabil Al-Hadithy
Planning and Development Department
2118 Milvia Street, Suite #200
Berkeley, CA 94704

Dear Mr. Al-Hadithy:

We have received the document entitled "Review of Radiological Monitoring at LBNL: Draft Final Report", February 2, 2001, which was prepared by Bernd Franke and Anthony Greenhouse, who are under contract with the City of Berkeley.

The comments we provided after reviewing the document entitled "Review of Radiological Monitoring at LBNL: Preliminary Technical Report," dated June 30, 2000, are still pertinent (see attached letter). Our only additional comment is the following: The location used to determine the maximally exposed individual (MEI) as stated in both A.3 (page 16:Paragraph 2) and A.5 (page 25:Paragraph entitled "Conclusions and Recommendations [b]) is not at the "fenceline" of a facility emitting radionuclides, but at an actual, real-time occupant location (i.e. - an occupant of a home, a school, an office, etc). The Radionuclide NESHAP requirement (40CFR, Subpart H, paragraph 61.94[a]) requires that a facility meet a standard associated with a "real" dose not a worst case dose.

Sincerely

A handwritten signature in black ink, appearing to read "M. S. Bandrowski", is written over a horizontal line.

Michael S. Bandrowski, Chief
Radiation and Compliance Assurance Office

Attachment

cc: Members of the Environmental Sampling Project Task Force

ATTACHMENT

U.S.EPA comments on “Review of Radiological Monitoring at LBNL: Preliminary Technical Report (June 30, 2000)” prepared by Bernd Franke and Anthony Greenhouse.

A. Exposures from current operations at LBNL

A.1 Is the tritium inventory of NTLF adequately determined?

The Nuclear materials Monitoring System (NMMSS) is not required for demonstrating compliance of NTLF with the R-NESHAPs regulation. The compliance of NTLF with R-NESHAPs is determined by actual emitted radionuclides and not the potential emissions represented by the quantity or inventory of radionuclides onsite. The adequate operation of the NMSS should be addressed by LBNL with the Task Force.

A.2 Are the releases of airborne tritium adequately monitored?

Dr. Franke points out that all tritium is assumed to be HTO while in reality tritium is composed of HTO and HT. Since HTO has much a greater biological significance than HT, this results in a more conservative estimate for the potential exposure levels generated and has always been used in CAP88. Dr. Franke states that, therefore, the exact amount of HT released is of minor importance. We agree.

The observation by Dr. Franke that the Overhoff data often indicating larger releases than the silica gel data. We have also made this observation and since the NESHAP compliance is based on the silica gel data, the malfunctioning Overhoff instruments, have no effect on the exposure calculations. The Overhoff instruments do, however, as Dr. Franke points out, provide data about the duration and relative magnitude of a release. This information combined with the meteorological data, allows one to predict which ambient monitors will show higher readings. Dr. Franke feels that there is biological significance to the releases being of short duration rather than continuous relative to the CAP88 modeled doses. We believe that for the small doses in question, as long as the total release is known from the silica gel data, the duration of these releases is insignificant; the effect is no greater than if the releases were continuous.

While short term releases are not required to be modeled under the NESHAPS, this is an issue that LBNL should discuss as part of the Task Force process.

A.3 Is tritium in air measured at the right locations?

Environmental Monitoring is not required by the NESHAPS, but is important for confirmation of modeled emission values. To this end, additional monitoring stations have been included in the Tritium Sampling and Analysis Plan. The final number of monitoring stations should be discussed by the LBNL with the Task Force.

Dr. Franke discusses the implications of short duration doses to a person at the fenceline. As indicated in our comment for A.2, for the releases and doses of the relatively small magnitude considered, we believe that the duration of the event would be insignificant. The person at the fenceline may receive a greater concentration of tritium, but in general, that person will be at the location for a small fraction of the time compared to a person working at the Lawrence Hall of Science (LHS) 8-hours/day, and 365-days a year. Therefore, modeling and monitoring at the LHS will not underestimate potential doses to the public, even when considering a person passing along the fenceline.

A.4 Is the sampling and analysis of tritium in air at a given location sufficiently accurate?

Dr. Franke discusses the problem of collecting atmospheric moisture under the conditions of high absolute, but low relative humidity such as experienced at the Los Alamos Laboratory. It would be useful to point out that in the study to which Dr. Franke refers, the researcher at Los Alamos failed to take into account the influence of the heat of the air pump in the sampler housing in his original research. Essentially, the heat was driving off the moisture that had been collected on the silica column. The LBNL operates cooling fans in their sampler housing. Additionally, the high desert conditions of Los Alamos, i.e. high absolute, but low relative humidity rarely occur in the San Francisco Bay Area even during periods of heat and drought. Furthermore, the LBNL samplers pump air at half the rate as those at Los Alamos, thus allowing air to be in contact with the silica gel for a longer period of time and allowing water with potential tritium content to be condensed and trapped onto the column for collection and analysis. Therefore, there is much less likelihood of under collecting atmospheric moisture and as Dr. Franke concludes, the sample data correlates well with the expected values.

Dr. Franke suggests that the silica gel may have an initial water load prior to exposure to the environmental sampling conditions. The EPA National Air, Radiation, and Environmental Laboratory (NAREL) is presently investigating this issue of water load on silica gel.

Dr. Franke in his discussion of the EPA/LBNL split sampling data project, states that "the analytical data for HTO in ambient air samples is verifiable and subject

to reasonable uncertainties.” The EPA agrees with this statement. The split sampling data supports the determination of compliance with the NESHAP and the EPA will continue these efforts.

B. Legacy Contamination from Past Operations/Superfund Issues

To briefly review the Superfund HRS process in relation to the LBNL, it may be recalled that during the past year the Tritium Sampling and Analysis Plan (TSAP) was developed in order to finish the HRS evaluation at the LBNL. The TSAP will provide additional data that are needed to meet the Superfund data quality requirements, confirm that the site is eligible for the Superfund list, and address citizen’s concerns. The HRS is a screening model used by EPA to assess and compare potential Superfund sites nationally for possible listing of chemical releases on federal Superfund. It is not appropriate to use the HRS to assess human health or environmental risk. The HRS was not designed for assessing risks and cannot be used as a substitute for a risk assessment. We note that LBNL completed a risk assessment in 1997 in response to community concerns regarding the risk of exposure to tritium emissions from the NTLF. They may be willing to supplement that risk assessment. This issue should be discussed with LBNL as part of the Task Force process.

In addition, we note that the DOE is adding the following two objectives to the TSAP: (1) Collect data of the appropriate type and quality for EPA to decide whether to place the site on the National Priorities List (NPL) and (2) Collect data of the appropriate type and quality to evaluate the tritium fate and transport model used in the report entitled, “Environmental Health Risk Assessment for Tritium Releases at the National Tritium Labeling Facility at the Lawrence Berkeley National Laboratory, 1997”).

B.1 Is LBNL’s Draft Tritium Sampling and Analysis Plan (TSAP) sufficient to determine the extent and nature of contamination at the National Tritium Laboratory Facility (NTLF)?

The draft Tritium Sampling and Analysis Plan should be supplemented as follows:

1. expansion of ambient air monitoring to cover all 16 wind direction sectors (of 22.5 degrees each)

EPA Response: Additional monitoring stations outside of the

predominate wind directions, while they may serve other useful purposes, are not useful for the HRS evaluation which compares the maximum ambient air concentrations detected to health based benchmarks.

2. use of HASL-300 core method for soil sampling, samples to be analyzed for additional depth increments

EPA Response: As discussed in our opening comment for Section B, we understand that DOE may be willing to add more or different samples and to supplement the 1997 risk assessment to reassure the public that nearby residents and school children visiting the Lawrence Hall of Science are safe. For the purpose of evaluating the site for the NPL, soil samples must be collected within 2 feet of the surface according to Section 4.7 of the *SI Guidance*. Consequently, samples from additional depth increments may not be used in evaluating the soil exposure pathway.

3. sampling of groundwater in coordination with the State of California Water Resources Control Board

EPA Response: As discussed in our opening comment for Section B, we understand that DOE may be willing to add more or different samples and to supplement the 1997 risk assessment to reassure the public that nearby residents and school children visiting the Lawrence Hall of Science are safe. For the purpose of evaluating the site for the NPL, as discussed in LBNL's July 3, 2000 letter to the State Regional Water Quality Control Board (RWQCB; Subject: Responses to RWQCB Comments on the May 1999 Draft Tritium Sampling and Analysis Plan for LBNL Environmental Protection Group), groundwater is not a significant pathway because groundwater within 4 miles of the site is not currently being used for drinking water and no drinking water wells within 4 miles of the site have been closed due to site-related contamination.

4. preliminary sampling efforts around Building 3 (Calvin)

EPA Response: As discussed in Section 300.420(b)(5)(iii) of the National Oil and Hazardous Substances Pollution Contingency Plan (commonly known as the "National Contingency Plan" or "NCP"), DOE as the lead federal agency is responsible for determining whether a preliminary assessment is appropriate in the case of a release or suspected release from a federal facility.

B.2 Which other factors need to be addressed in EPA's evaluation of the Superfund status for the NTLF site?

Inclusion of a section describing NTLF operations during sampling time when reporting the results.

EPA Response: IFEU is recommending that when reporting the sampling results, DOE should confirm that NTLF's operations were in fact representative by describing those operations, including actual shipment of products and number of tritiations performed during that time frame. EPA supports reporting this information to provide additional assurances to the community that the sampling coincided with active releases. Please note that EPA's August 25, 1999 comments on the draft Tritium Sampling and Analysis Plan for LBNL recommended (in Item #5 on page 4 of the enclosed memo) that DOE provide the previous and planned schedule for tritium use that may significantly affect the tritium concentrations in the ambient environment, depict the scheduled sampling events on that timeline, and plan the sampling to coincide with active releases. We wish to emphasize that in its letter dated January 21, 2000, DOE responded to EPA's comments, indicating (in Item #5 on pages 7 and 8 of the enclosed response to comments) it has adopted this approach to ensure that the sampling will coincide with all potential tritium release activity.

EPA should provide information as to how the hazard ranking score would change if the Lawrence Hall of Science would be regarded as a school, accounting for student population.

EPA Response: Based on the 1997 ambient air monitoring data at LBNL, counting 300,000 annual visitors to the Lawrence Hall of Science as students would not affect the overall HRS score for this site. We are, however, concerned that some community members believe that EPA's HRS assessment of LBNL ignores potential health threats to school children visiting the Lawrence Hall of Science. The HRS is the scoring system used by EPA's Superfund Program to screen and assess the relative threats associated with actual or potential releases of hazardous substances. As such, the HRS model makes conservative, health-protective assumptions to ensure that sensitive populations potentially exposed to such releases over long periods of time are considered when ranking the site. While the HRS model does not include occasional visitors (such as children visiting the Lawrence Hall of Science) in the target population calculation, the model makes other conservative assumptions which are factored into the site score. For example, EPA's evaluation of LBNL already assumes that the population residing within one-quarter mile of the NTLF has the same level of exposure (to air emissions of tritium) as someone residing or working on the site.

